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CENTRAL INTELLIGENCE AGENCY

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C-O-N-F-I-D-E-N-T-I-A-L

COUNTRY Poland

REPORT

SUBJECT Chorzow Nitrogen Plant

DATE DISTR.

**10 JUL 1959**

*(Productiva, Description, Manpower)*

NO. PAGES

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SOURCE EVALUATIONS ARE DEFINITIVE. APPRAISAL OF CONTENT IS TENTATIVE.

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report containing

information on the Chorzow Nitrogen Plant in Chorzow.

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COUNTRY: Poland

DATE DISTRIB: 22 June 1959

SUBJECT: The Chorzow Nitrogen Plant

NO. OF PAGES: 2

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1. The Chorzow Nitrogen Plant (Zaklady Azotowe Chorzow) was originally built before and during World War I by the Reichsstickstoffwerke Chorzow to produce calcium cyanamide. The construction of the ovens has not changed since 1922. The plant was situated on the west side of the Brzeziny-Slask-Katowice railroad at Chorzow. It had an estimated 1600 workers. The managing director was Rubyk (fnu) until October 1958, when he was transferred to the Coke-Chemical Metallurgical Association (Zjednoczenie Koksochemicznego-Hutnicze). The plant produced about 35,000 kw of electric power in four turbines. Since 1955, two new La Mont boilers with powdered bituminous coal burners have been built for steam production; older boilers had traveling grates.

The main products of the plant were calcium carbide, calcium cyanamide, and synthetic  $\text{NH}_3$ .

2. Calcium Carbide. The plant operated three ovens, each with a capacity of about 300 tons of carbide a day, and six ovens, each with a capacity of about 150 tons a day. Two of the larger ovens used 0-15 mm semi-coke from Oswiecim; they had a lower specific consumption, probably because of higher reactivity and higher electric resistance of the coke. The other ovens used high-temperature coke, normally a mixture of 30 percent 0-5 mm breeze and 70 percent 10-20 mm lump. The carbide was in the following sizes:

0-2 mm	about 5-7 percent
2-4 mm	of
4-7 mm	each size
7-35 mm	about 20 percent
35-80 mm	about 73-75 percent

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The average acetylene yield of the carbide was 295 to 302 liters per kilogram. Production of one ton of carbide required 4200 kwh, about one ton of  $\text{CaCO}_3$ , and about 0.8 ton of coke.

3. Calcium Cyanamide. About 30 percent of the carbide produced, with an added three percent of  $\text{CaF}_2$ , was used to produce cyanamide. Pilot plants were operated to produce "white" cyanamide from  $\text{CaCO}_3$  and  $\text{NH}_3$  and to produce KCN from KOH, CO, and  $\text{NH}_3$ .
4.  $\text{NH}_3$ . The  $\text{NH}_3$  synthesis was carried out in two units, each with a daily capacity of about 600 tons. Synthesis gas was produced from high-temperature coke in semi-automatic water-gas producers of the Bamag type, each with a capacity of 3500 to 5000 cubic meters per hour. Since 1947-1948, the catalyst used in the synthesis process was the usual I.G. Farben catalyst.
  - a. A pilot plant for production of water gas from bituminous coal by the Koppers-Totzek method was put in operation in 1954. The water gas shift was carried out at atmospheric pressure. The catalyst used in this process was the so-called brown oxide (about 85 percent  $\text{Fe}_2\text{O}_3$  and 15 percent  $\text{CO}_2\text{O}_3$ ).
  - b. The dry method, with a mixture of bog iron ore and the so-called "Lauta" residue (a by-product of the aluminum industry) imported from East Germany, was used to remove sulfur from a portion of the gas. Sulfur and  $\text{CO}_2$  were removed from the remainder. The towers for this purpose were about 18 meters high and had an hourly throughput of about 8000 cubic meters of gas each. The exit gas still contained 1.6 percent of  $\text{CO}_2$ . The pressure water was expanded in Pelton turbines. The energy recovered during expansion was about 60 percent of the power needed for pumping water to the top of the towers.
  - c. CO was removed under pressure of about 25 atmospheres, using ammoniacal copper solution at about  $15^\circ$  to  $20^\circ$  C during absorption. Regeneration was carried out under a vacuum of 150 to 200 mm Hg at about  $40^\circ$  C in two stages.
  - d. Most of the  $\text{NH}_3$  produced was bound as ammonium sulfate, the remainder, after part was oxidized to  $\text{HNO}_3$ , as ammonium nitrate, ammonium sulfate-nitrate, ammonium chloride, and ammonium phosphate. In the last months of 1958, a pilot plant to produce ammonium carbonate and another to produce urea began operating.

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